Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Pd: \_\_\_\_\_

**17.2 Current Electricity Note Guide**

Textbook pages \_\_\_\_\_\_\_\_\_\_\_\_ - \_\_\_\_\_\_\_\_\_\_\_

**Voltage**

* Voltage across two ends (otherwise known as \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_) of a battery can range from \_\_\_\_\_\_\_\_\_\_ V (\_\_\_\_\_\_\_\_\_\_ battery) to \_\_\_\_\_\_ V (\_\_\_\_\_\_\_\_ battery).
  + Voltage *causes* \_\_\_\_\_\_\_\_\_\_\_\_\_\_ to move!
* Batteries are \_\_\_\_\_\_\_\_\_\_\_\_\_\_: which are devices that \_\_\_\_\_\_\_\_\_\_\_\_\_\_ an electric \_\_\_\_\_\_\_\_\_\_\_ by \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ energy into \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
  + A battery contains:
    - Electrolytes: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
    - Electrodes: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
* AS VOLTAGE \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, CURRENT \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (AND VICE VERSA).
  + This is a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ relationship, which means: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

**Electric Current**

* Electric current: rate at which \_\_\_\_\_\_\_\_\_\_\_\_\_\_ (\_\_\_\_\_\_\_\_\_\_) move through a \_\_\_\_\_\_\_\_\_\_\_.
  + Current is measured in \_\_\_\_\_\_\_\_\_\_\_\_\_\_ (\_\_\_\_).
* Direction of current in a wire is \_\_\_\_\_\_\_\_\_\_\_ to the direction \_\_\_\_\_\_\_\_\_\_\_\_\_\_ move.

**+ -**

\_\_\_\_\_\_\_\_\_ will flow towards the \_\_\_\_\_\_\_\_\_\_\_ charge. That’s which direction? \_\_\_\_\_\_\_\_\_\_\_

🡨🡨 **Electrons**

But \_\_\_\_\_\_\_\_\_\_\_\_\_ is the opposite direction. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

🡪🡪 **Current**

So **curren**t flows from \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

And **electrons** get pulled \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ the positive charge.

ELECTRIC CURRENT IS IN THE \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ DIRECTION OF \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

**Electrical Resistance**

* Resistance: caused by internal \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ which \_\_\_\_\_\_\_\_\_\_\_\_\_\_ the movement of \_\_\_\_\_\_\_\_\_\_\_ through a conductor.

Formula for electrical resistance:

**Resistance = or R = or**

* + R = \_\_\_\_\_\_\_\_\_\_\_\_ which is measured in \_\_\_\_\_\_\_\_ and uses the symbol \_\_\_\_\_\_\_.
  + V = \_\_\_\_\_\_\_\_\_\_\_\_ which is measured in \_\_\_\_\_\_\_\_ and uses the symbol \_\_\_\_\_\_\_.
  + I = \_\_\_\_\_\_\_\_\_\_\_\_ which is measured in \_\_\_\_\_\_\_\_ and uses the symbol \_\_\_\_\_\_\_.
    - *Example 1*: Calculate the resistance in a circuit if the current is 3 A and the

voltage is 1 V.

* + - * Which formula will we use? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
      * Show all **3** steps every time!!
        + Step 1: Step 2: Step 3:
    - *Example 2*: Calculate the current in a circuit if the resistance is 1.5 ohms

and the voltage is 7.

* + - * Which formula will we use? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
      * Show all **3** steps every time!!
        + Step 1: Step 2: Step 3:

**Conductors, Insulators and Semiconductors…Oh my!**

* Conductors have \_\_\_\_\_\_\_\_\_\_\_ resistance (the electrons flow \_\_\_\_\_\_\_\_\_\_\_\_\_).
* Insulators have \_\_\_\_\_\_\_\_\_\_\_\_ resistance (the electrons \_\_\_\_\_\_\_\_\_ flow easily).
* Semiconductors conduct only under certain conditions.
  + They are \_\_\_\_\_\_\_\_\_\_\_\_\_\_ in their pure state and when certain types of atoms are added, the material becomes a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (allows electrons to flow \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_).
  + Used in manufacturing of most \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ like cell phones and computers.

**Types of Current**

* Alternating Current (AC)
  + Power that comes from a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
  + Direction of current \_\_\_\_\_\_\_\_\_\_\_ or alternates (60 times per second!)
  + The power we receive from a wall socket in the US is 120 V, 60-cycle \_\_\_\_\_\_\_\_ power.
* Direct Current (DC)
  + \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, fuel cells, and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ all produce DC.
  + The positive and negative \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of a battery are always respectively positive and negative.
    - \_\_\_\_\_\_\_\_\_\_\_\_\_ always from in the same direction (direct) between those two terminals.
* So why do we have two types of current? (Ben Franklin video clip in PPT on wikispace).
  + The reason why we have two types of current is because AC is best used for power grids because \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
  + However, DC is commonly used in \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
    - Because these devices need DC, that means that the device has to convert AC to DC and sometimes \_\_\_\_\_\_\_\_\_\_\_\_ is lost (which is why your laptop may feel warm).